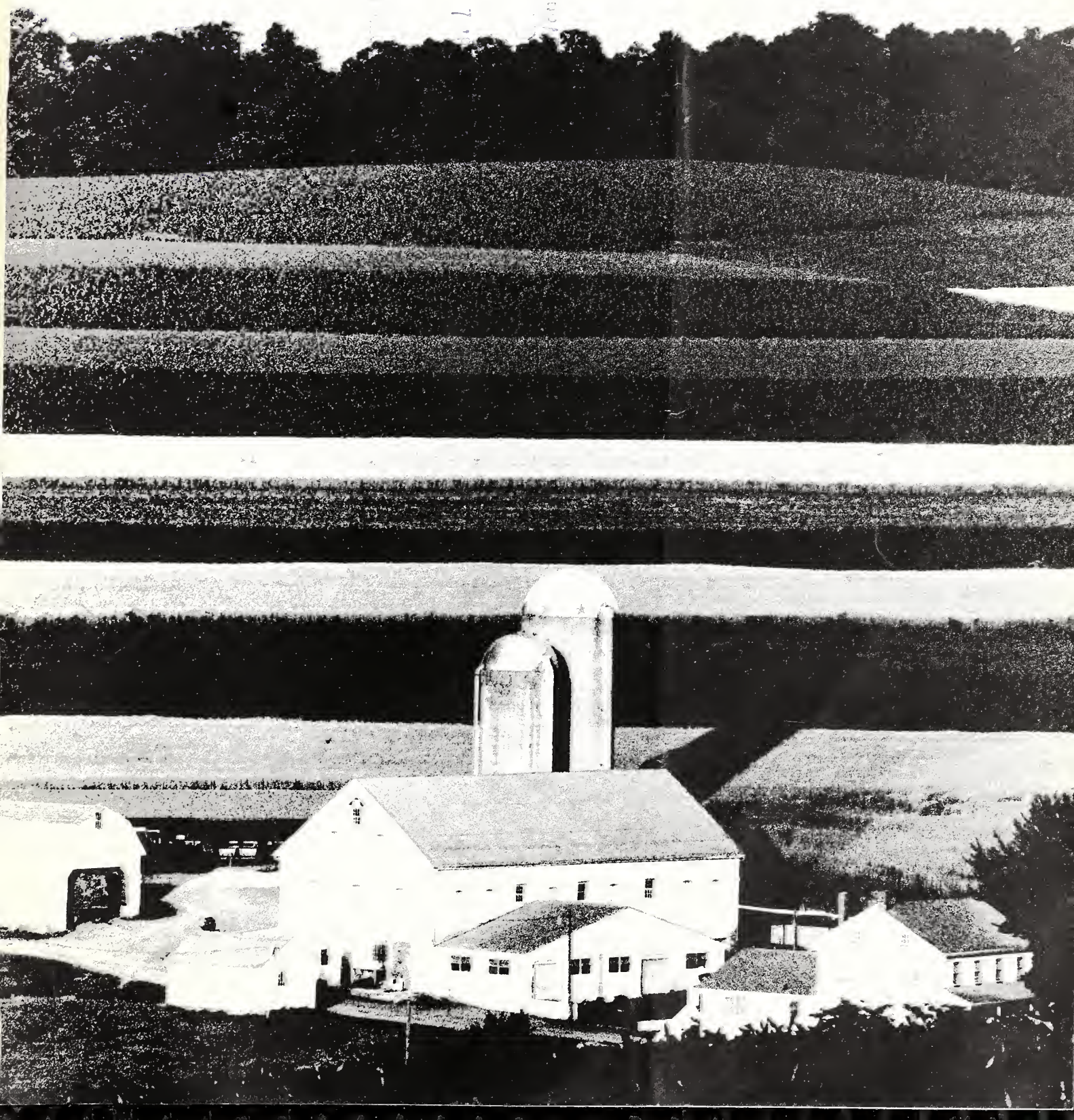
September 1987 Volume 8, Number 6

Soil and Water Conservation News

United States Department of Agriculture
Soil Conservation Service



Soil and Water Conservation News is the official magazine of the Soil Conservation Service. The Secretary of Agriculture has determined that publication of this periodical is necessary in the transaction of public business required by law of this Department. Use of funds for printing *Soil and Water Conservation News* has been approved by the Director of the Office of Management and Budget. *Soil and Water Conservation News* (ISSN–0199–9060) is published 12 times a year. Postage paid at Washington, D.C.

Magazine inquiries
Send inquiries to: The Editor, *Soil and Water Conservation News,* Public Information Division, Soil Conservation Service, U.S. Department of Agriculture, P.O. Box 2890, Washington, D.C. 20013–2890.

Subscriptions
Send subscription orders to:
Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Comments:
From the SCS Chief

Controlling Soil Erosion

Soil erosion affects every American. Left uncontrolled, erosion by wind and water can devastate fields and vegetation and bring long-term damage to soil productivity. This is costly for farmers and ranchers and, ultimately, for consumers. Soil deposited off site endangers health and safety and increases everyone's tax burden: It reduces the quality of air and water and increases flood damage and the cost of maintaining roads and bridges. Fish and wildlife suffer when habitat is damaged.

Excessive erosion continues to be a problem on agricultural land. Sheet and rill erosion or wind erosion is excessive on about 40 percent of this Nation's cropland, 18 percent of our nonfederal rangeland, 9 percent of our pastureland, and 6 percent of our nonfederal forest land. Of course, these figures don't account for the concentrated-flow erosion on cropland resulting from large gullies and from smaller "ephemeral" gullies, which are highly destructive also. These gullies not only account for major soil losses but are the principal avenues through which other pollutants leave the fields.

Off-site damages caused by soil erosion are greater than loss to soil productivity in any single year. Preliminary studies indicate that water erosion and runoff from agricultural land may be costing the Nation at least $6 billion (in 1980 dollars) annually. Wind erosion also causes off-site damage.

But, I think we can lick these problems. We've already made great strides in erosion control. An unprecedented number of farmers and ranchers are adopting conservation tillage, intensified grazing management, grassed waterways, and other erosion control practices. Communities are taking action to curb erosion in developing areas. And now we have the Food Security Act of 1985—the most comprehensive and powerful legislation this country has ever enacted for soil conservation. The Conservation Reserve Program, just one of the conservation provisions of the Food Security Act, has resulted in actions that will cut annual soil loss by more than 400 million tons per year on the land signed up thus far—and we've only reached about half the goal of enrolling 40 to 45 million acres.

Agricultural research promises even greater strides. We're learning more about all types of conservation treatments that allow producers to make a profit. New computerized models for erosion prediction incorporate our understanding of the physical processes of erosion. Improvements in these prediction tools will help us do a better job of designing total resource management systems, and they'll improve our assessments of both onsite and off-site damage from erosion. State-of-the-art mapping technologies, data collection, data management, and geographic information systems are increasing our speed and accuracy in acquiring and using soils data and other natural resource information. Sociological and economic studies are helping us to better understand how changes in agriculture, in rural communities, and in Federal agricultural policies affect conservation decisions.

Turning this research into soil savings on the land is a real team effort. The Soil Conservation Service is proud to serve on that team alongside this Nation's conservation districts and other conservation cooperators.

Cover: Strips of corn, wheat, and alfalfa grown on the contour control soil erosion on farm in York County, Pa. (Photo by Ron Nichols, photographer, SCS, Washington, D.C.)

Richard E. Lyng
Secretary of Agriculture

Wilson Scaling, Chief
Soil Conservation Service

All programs of the U.S. Department of Agriculture are available to everyone without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

Editor, Nancy M. Garlitz

Associate Editor, Paul D. Barker

Editorial Assistant, Ann P. Serota

Design Consultant, Christopher Lozos

In an ARS study of the transport and deposition of sediment, Jau-Yau Lu (right), hydraulic engineer, and Scott McAfee, technician, pour dye in flowing sediment and film the procedure from above for later analysis. This study is part of the ongoing research at the National Soil Erosion Research Laboratory on the campus of Purdue University in West Lafayette, Ind.

Photo by Tim McCabe, photographer, USDA, Agricultural Research Service (ARS), Beltsville, Md.

Research to Focus on Erosion

In a recently released biennial report on research needs, the Soil Conservation Service assigned highest priority to 102 research needs in seven broad areas. About half of those research needs concern the development of improved conservation cropping and grazing systems, research on socioeconomic issues, or improving methods of collecting and using natural resource data. The other half deal directly with the onsite effects of soil erosion, water quality and other off-site effects of soil erosion, and methods for predicting erosion.

The report, "1987 Soil and Water Conservation Research and Education Progress and Needs," was prepared by the agency's National Research Committee. Copies were provided in June to Federal and State research and education agencies and cooperating private organizations.

"Unless the harmful effects of erosion can be validly predicted, documented, and evaluated in light of possibilities for restoration of eroded soils," the report states, "public policy makers and private land managers cannot make rational decisions on soil conservation."

Although the technical assistance provided by SCS to farmers, ranchers, and other resource managers involves the transfer and application of research findings, SCS is not—except in the case of surveying soils—a research agency. SCS personnel do, however, work closely with research agencies to develop research objectives, adapt research findings to SCS programs, and demonstrate the practical applications of the research findings to land users.

Over the years, the research needs of SCS have changed according to public policy and new developments in technology and land use. The research needs currently given highest priority are those submitted to

the research committee that have national significance and relate to the conservation provisions of the Food Security Act of 1985 and to the national priority goals adopted in 1982 for the National Program for Soil and Water Conservation.

Study of the onsite effects of erosion continues to be an active area of research, particularly in assessing the impact of erosion on agricultural productivity. Several recent studies have generally found that the more eroded soils are less productive. But little is being done, the report notes, on the costs of erosion and damage to standing crops.

Other high priority needs include research on soil variability, soil profile modifications, the impact of erosion channels, the relationships of soil landscapes to geographic distribution, the effectiveness of conservation practices and systems, adapting conservation to fields with heterogeneous soils, reversing the adverse soil changes caused by erosion, and the characteristics of benchmark soils.

"We need sound information on the behavior of soils and crops in relation to weather and management systems as a valid basis for evaluating the nature, extent, and significance of changes in agricultural land resulting from erosion and deposition; for weighing the costs of conservation measures against their benefits; and for judging the efficiency and adequacy of conservation practices and systems," the report states.

The off-site effects of land management practices are described in the report as a diverse and complex puzzle. "Yet," the report continues, "pieces of the off-site puzzle are being studied and many pieces are fitting together." The report cites progress by several different agencies and organizations in the study of sediment/pollutant yield and delivery, ground water effects, surface water effects, and combined effects. "Modeling has been carried out at all levels from specific onsite work to national estimation; yet, many questions remain and many pieces of the puzzle still elude us."

The report cites progress in several areas of instream impacts, including biological, recreational, water storage, navigational, and commercial fishing. Studies are also progressing on such off-stream impacts as flood damages, water-conveyance effects, water treatment costs, and saltwater intrusion.

"Research on off-site effects of land management practices has not kept pace with the need for knowledge in this area," the report states. "These effects are recognized as more pronounced than previously thought. Agricultural runoff, for example, has been estimated to chronically affect fish communities in 30 percent of the Nation's waters. Evidence is accumulating that off-site effects are undervalued or overlooked in economic analyses of conservation projects and may have a greater economic significance than onsite effects. Therefore, we need to know more about the off-site effects of sediment, agricultural chemicals, and animal wastes on land and water resources. These effects may be fish habitat losses from sediment deposition or other adverse water quality changes, sediment deposition causing recreational, crop, or water storage capacity losses; productivity losses from increased salt concentrations downstream from certain irrigation or

Diane Stott, microbiologist with ARS, compares the chemical properties of soil organic matter found in different sediment samples. She is investigating a possible link between soil's organic-matter content and its erodibility.

Photo by Tim McCabe, photographer, ARS, Beltsville, Md.

drainage practice installations; ground water contamination from agricultural chemicals; and other similar effects. The challenge is to accelerate water quality and other off-site effects studies, focusing on the most relevant issues."

Specific needs listed in the report include research on a water quality watershed model, the economic values of the biological impacts, the effects of wind-eroded particles on water quality, the effects of conservation tillage on ground water, the effects of pesticide transformations on the environment, the sediment yield from ephemeral gullies, the validation of simplified flood routing techniques, the "disadvantaged" factor for project evaluation, the social trauma due to floodwater and sediment, the effectiveness of remedial measures on water quality, the effects of contaminants from flooded areas on water quality, the evaluation of runoff curve number variation, the hydrodynamics of stream substrate water quality parameters, methods for proportioning filter strips, and wetlands.

In the area of erosion prediction, wind erosion is receiving increased emphasis as a result of difficulties in implementing the conservation provisions of the Food Security Act of 1985 and assessing the impact of wind erosion relative to water erosion. The report notes that major progress has been centered around the Water Erosion Prediction Project (WEPP) and the Wind Erosion Prediction System (WEPS) of the U.S. Department of Agriculture's Agricultural Research Service. "Both projects involve erosion prediction through the simulation of actual physical erosion processes. Both projects have been developed in close cooperation with SCS and other agencies, and a detailed statement of the user requirements for WEPP is available. Also, major progress has been made in the prediction of cropland erosion by concentrated flow (ephemeral gully erosion) and erosion from irrigation furrows. Much of the remaining work in erosion research is in support of these efforts, particularly on the effects of soil properties, climate and weather, and crop residues and management."

Photo by Tim McCabe, photographer, ARS, Beltsville, Md.

Charles Meyer, left, computer analyst, ARS, and George Foster, hydraulic engineer, formerly of ARS and now with the University of Minnesota, examine the latest data in the development of the Water Erosion Prediction Project (WEPP). WEPP is expected to help SCS field personnel predict erosion rates as required for implementing the conservation provisions of the Food Security Act of 1985.

Erosion-Reduction Rule Amended

An amendment to U.S. Department of Agriculture (USDA) interim rules implementing the Food Security Act of 1985 gives farmers a better chance to meet soil erosion reduction goals and to retain their USDA program benefits.

"We want to achieve significant reduction in erosion without imposing unreasonable economic costs on producers or on the taxpayers," said Wilson Scaling, chief of the Soil Conservation Service.

The amendment says that conservation plans or systems developed under the highly erodible land conservation provisions of the act will be based on the technical guide at local SCS offices. This new policy eliminates use of a rigid soil-loss tolerance (T) standard for soil and crop situations where such a standard is not economically or technically feasible.

To many of this Nation's agricultural producers, the amendment is significant because their eligibility for USDA farm program benefits hinges on conservation plans required under the highly erodible land conservation provisions—more commonly known as the "conservation compliance" and "sodbuster" provisions. Until this amendment, those plans had to provide for reduction of soil loss to levels not exceeding T (or 2T for some areas).

"In many parts of the country, T, or even 2T, just isn't a reasonable standard," said Scaling. "So, we are relying on the professional soil conservationist's good judgment with input from local soil conservation districts and others in developing acceptable alternatives to be included in the field office technical guide."

Scaling emphasized that acceptable conservation systems included in the SCS field technical guides will consist of high quality practices and will, in most cases, reduce erosion to levels approaching the soil loss tolerance level.

This amendment is the only official change so far to the interim rule on highly erodible land and wetland conservation, which was published June 27, 1986.

Conservation Plants Hold Their Ground

Stabilizing St. Lucie

A concrete structure at the toe of the streambank, at right in photo, and a new planting protected with netting at the top of the bank protect this St. Lucie Canal streambank from erosion.

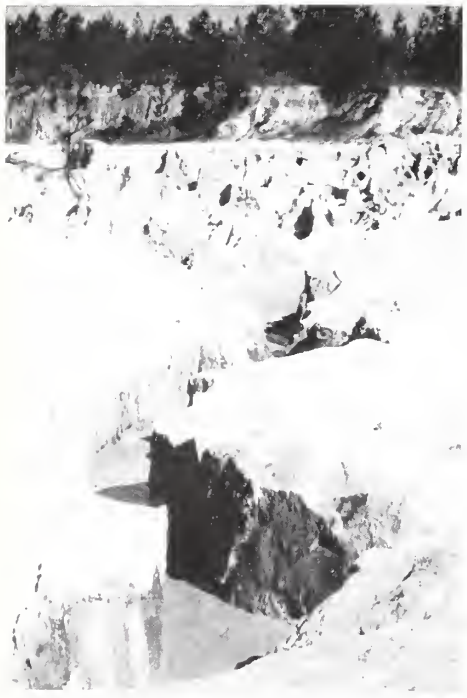
In southeast Florida, the water supply and flooding are controlled largely by the storage and release of water in Lake Okeechobee. The water is released through a system of canals. One canal, the St. Lucie Canal, has been eroding at the rate of 1 foot per year since 1930.

Stormwater is stored in Lake Okeechobee during the summer rainy season and released during the dry winter to recharge well fields. Water is also periodically released to maintain water levels in the lake. Through the years, St. Lucie Canal has been flushing sediment into the St. Lucie Estuary. This sediment is clogging the estuary and killing the fish. Erosion has eaten away the original right-of-way, barely leaving enough land to shape and stabilize.

The Martin County Soil and Water Conservation District made erosion control along the canal its top priority. The district brought together the Soil Conservation Service, the U.S. Army Corps of Engineers, South Florida Water Management District, and the County Board of County Commissioners to find a solution to the problem.

A plan was developed to establish three demonstration sites—one structural, one vegetative, and one vegetative with a structural toe. The Corps prepared the sites and purchased structural material such as rock riprap, and the water management district and county commissioners purchased other supplies for the stabilization work. SCS established and evaluated 350 plots of 36 plant accessions and 18 plant species for 3 years beginning in 1984.

Three plant species, common centipedegrass, a short stoloniferous grass; 'Alamo' switchgrass, a tall bunchgrass; and 'Pensacola' bahiagrass, of medium height



Water has cut deep paths in this untreated borrow pit in western Florida, causing serious onsite and off-site resource problems.

Plants to Cure Critical Areas

Plant materials offer hope for critically eroding areas in western Florida. Untreated borrow pits, cropland gullies, and roadside erosion are causing extensive onsite and off-site damage. The sedimentation from borrow pits, where water cuts deep paths to an outlet, poses serious water quality problems.

The Florida Division of Forestry and the Soil Conservation Service are working together to cure some of these critically eroding sites. In 1983, the SCS plant materials center (PMC) in Brooksville established plots of 50 plant species to test their adaptability to solving some of the area's worst erosion problems.

Two releases, 'Alamo' switchgrass and 'Atlantic' coastal panicgrass, have performed exceptionally well. They compared favorably with centipedegrass, common bermudagrass, and 'Pensacola' bahiagrass in February and June 1984 plantings. All five species have been successfully established at recommended rates with and without lespedeza and have persisted for 3 years.

'Halifax' maidencane has performed best on wet sites. It has established quickly and spread fast from rhizomes. 'Redalta' limpograss did well, but only in constantly moist and fertilized conditions. 'Shoreline' common reed did not establish or spread well.

Giant reed was the best of the unreleased species. Fifty plant accessions were collected and six have been selected for advanced evaluation. Saltmeadow cordgrass and brunswick grass also performed well. A cultivar of cordgrass will soon be released by the Brooksville Plant Materials Center and brunswickgrass by the SCS Plant Materials Center in Americus, Ga.

The knowledge gained from these tests is already being used. Gullies and borrow pits have been graded smooth, equipped with stable outlets, and seeded to bermudagrass with pine trees planted into the grass.

Robert J. Glennon,
plant materials specialist, SCS, Brooksville, Fla.

with short rhizomes, performed well on the area above the toe. The combination of structural and vegetative measures did well in controlling the erosion. However, none of the plants were able to tolerate the force of boat wakes on the waterline and the fluctuating water levels at the toe. A structure is needed to hold the toe of the slope.

A final demonstration along the canal bank will be established this year with a structural toe and hydroseeded slope. The model will demonstrate what can be done along more of the canal by landowners and agencies in their efforts to stabilize St. Lucie.

Robert J. Glennon,
plant materials specialist, SCS, Brooksville, Fla.

Plants Stabilize Riverbank

The Yellowstone River kept carving its way closer and closer to Bob Heinle's cropland. Heinle, a farmer in Hathaway, Mont., and a supervisor of the Rosebud Conservation District, needed a low cost way to control the riverbank erosion.

Dennis Loreth, district conservationist for the Soil Conservation Service at Forsyth, Mont., recommended using vegetation.

In the spring of 1984, about 1,000 feet of riverbank was shaped and graded and the topsoil replaced. Heinle broadcast seeded a mixture of smooth brome and reed canarygrass and covered the area with straw mulch. A biodegradable net held the seed and mulch in place.

In February, Heinle had collected local cuttings of willow, tamarix, and dogwood and stored them in a cooler. Heinle planted the 6,000 cuttings at the base of the riverbank in May. Once the cuttings and shrubs were in place, a fence was put up to keep cattle off the new plantings.

The vegetated bank did not erode through two spring flows. The real test came in 1986, when the Yellowstone River flooded, bringing ice jams with it. The grass and shrubs withstood the punishment.

Rock riprap costs $40 to $100 per linear foot. Heinle's costs for vegetative streambank stabilization were $8.60 per linear foot, including about $2,800 worth of family labor. One farmer said, "I like a project that will do with vegetation what we used to do with rock, and do it at a close to reasonable cost."

Jeff Zimprich,
district conservationist, SCS, Glasgow, Mont.

Cordgrass Holds Up Bank

'Avalon' saltmeadow cordgrass was recently developed by the Soil Conservation Service's Cape May Plant Materials Center in New Jersey. It is a superior selection of saltmeadow cordgrass used for controlling erosion on tidal streambanks. 'Avalon' is a salt-tolerant perennial grass that spreads by underground rhizomes. It can grow in sandy or clay soil above the high tide elevation to protect streambanks against continual wave action.

There are several thousand miles of shoreline along tidal streams from North Carolina to Massachusetts, and most of this shoreline is actively eroding. On severe sites, the shoreline is moving landward as much as 10 feet per year, destroying valuable land. Saltmeadow cordgrass grows above the mean high tide elevation and can help prevent this destruction of land.

Although saltmeadow cordgrass does produce seed, reproduction of 'Avalon' is entirely vegetative. Planting stock can be grown in small peat pots and transplanted on tidal sites from May to July. Plants should be placed 18 inches apart to establish adequate vegetative cover within a year.

Stable tidal shorelines can protect valuable land, reduce sedimentation, and protect water quality.

Cluster R. Belcher,
plant materials specialist, SCS, Somerset, N.J.

Donald W. Hamer, Sr.,
manager, plant materials center, SCS, Cape May, N.J.

Saltmeadow cordgrass helps protect this tidal bank in Virginia Beach, Va., from erosion.

Beyond Amateur Status

Helen Bowdoin has gone from summers on the farm in Maryland, to volunteer work in Oklahoma, to worries about program funding in Massachusetts. She is now vice chairperson of the Middlesex Conservation District just west of Boston.

In 1983, Bowdoin was in Tulsa, Okla., when she read a newspaper article about the volunteer program of the Soil Conservation Service. "I had come to Tulsa for an extended visit with a friend and was looking for something to do," she said. "I had an interest in the environment that I had acquired during summers on my grandmother's farm in Maryland. I figured the SCS program would give me a chance to grow beyond an amateur conservationist."

She became a volunteer for the SCS field office in Tulsa and performed jobs ranging from answering the telephone to helping develop conservation plans in the field. "I was able to contribute and learn a lot in Tulsa," she said. "I was there while the building boom was still going on and the erosion around construction sites was bad. Developers have to be taught how to deal with the hills, sandy soil, and thunderstorms that can severely erode a construction site."

After 4 months in Oklahoma, Bowdoin returned home to Massachusetts and found that the Middlesex Conservation District was shorthanded, especially in the area of conservation education. She volunteered, and her Tulsa experience landed her the task of editing a quarterly newsletter and conducting annual workshops for teachers. When a position on the district board became open, Bowdoin was selected.

Boston and its surrounding suburbs are growing with new high technology industries. As a result, development pressures are tremendous on the remaining farm and forest land in Middlesex County between Concord and Lexington.

"We still have farms and a good deal of forest land," Bowdoin said, "but there's not that much open space left back East. We have some laws on the books that give farmers tax breaks or the chance to sell development rights to the State, which keeps the land in farming. Trouble is finding funding for the purchases and educating everyone to the need."

Although the problems are different, Bowdoin considers education just as critical to conservation work in Massachusetts as in Oklahoma. She emphasizes the importance of agriculture and how open lands enhance the quality of life through wildlife and scenic beauty.

"People are just starting to realize the importance of local farms or forests," she said. "We're working to make them consider preserving some of the area's remaining open space."

Adapted with permission from an article by Mark Lee, farm editor, in the November 8, 1986, issue of *Tulsa World*, Tulsa, Okla.

Helen Bowdoin, an SCS volunteer, and Ray Hisaw, an SCS soil conservation technician at the Tulsa, Okla., field office, look where gully erosion has exposed underground utility lines.

Oklahoma District Develops New Guide

Urban erosion control is one of the Oklahoma County, Okla., Conservation District's main priorities. The district board recently received a grant from the U.S. Environmental Protection Agency to develop urban erosion control standards and specifications.

The district board formed a technical advisory committee that included representatives from the Development Council of the Central Oklahoma Home Builders, America Society of Landscape Architects, Oklahoma Conservation Commission, Association of Central Oklahoma Governments, the cities of Edmund and Oklahoma City, and the Soil Conservation Service.

A product of their effort is a manual entitled: "A Self-Help Guide to Urban Soil and Water Conservation Practices for Developers and Landowners." The guide is in a 6- by 8-inch binder and provides developers a step-by-step approach to erosion control on small urban sites. The manual contains standards and specifications for practices in five categories: managing stormwater runoff, re-establishing vegetative cover and stabilizing disturbed areas, trapping sediment, managing excavation activities, and managing roadsides. The district has also developed two pamphlets and a slide program on urban erosion control.

The self-help guide has been prepared for use by urban landowners or developers in planning development projects on 10 acres or less. Allan Williams, conservation district director, said, "It is just not possible for the district to provide onsite assistance with all of the many development projects going on."

The guide is not intended to replace technical advice from local SCS personnel or private engineering consultants, but to supplement these efforts. For more information about the guide contact the Oklahoma County Conservation District, 1016 Northwest 67th, Suite E, Oklahoma City, OK 73116.

F. Dwain Phillips,
public affairs specialist, SCS, Stillwater, Okla.

The Greening of Silver Valley

Smelterville, Idaho, has silver. It has gold. But the people who live here would be a lot happier if their grass were greener.

Smelterville, home for about 800 people, is located in northern Idaho's famous Silver Valley where precious metals such as silver and gold have been mined, smelted, and refined over much of the past 100 years. The town is adjacent to a smelter that once emitted large amounts of lead and other toxins into the air, creating serious problems on the steep slopes of the Grouse Creek watershed above the town.

Over the years, wind currents apparently concentrated the toxic emissions on a 150-acre area in the steep forests of Western white pine and deciduous trees. The results: acidic soil and reduced availability of potassium and phosphorous. This led to denuded hillsides eroding at a rate of up to 120 tons of soil per acre per year. An estimated 12,600 tons of sediment entered Grouse Creek each year.

The sediment clogged the stream channel, which caused flooding during spring snowmelt, high-intensity rainstorms, and other periods of high runoff. The floods caused extensive damage to homes and yards in the town, and sediment removal became an expensive and time-consuming problem for city and county work crews.

A homeowner at the edge of the creek, which flows directly into Smelterville, described a June 1980 flood as a nightmare. "Water came rushing down the creek like a tidal wave and filled our basement with mud," he said, pointing to 8-foot-high water marks in his basement. "Thankfully, no one was hurt. It was horrible—all that mud and water."

Soon after the 1980 flood, Shoshone County and Smelterville officials went to the Kootenai–Shoshone Soil Conservation District for help. The district, in turn, submitted a request for assistance though the Idaho–Washington Resource Conservation and Development (RC&D) Area. The project was accepted as an RC&D measure, and Soil Conservation Service engineers and other specialists began looking at the problem and developing possible solutions.

With SCS assistance, a plan was developed that included structural practices for the immediate protection of the town and vegetative practices to stabilize the eroding slopes. Work on two sediment basins and a retaining wall was begun in 1985 and completed in 1986. The basins, which are constructed of rock gabions, can catch about 65 percent of the sediment that enters the stream and provide storage for 8,600 tons of material. The retaining wall protects a vulnerable segment of the stream channel where it enters the town and makes a 90-degree turn. As part of its contribution to the project, the county rebuilt an access road, hauled in rock riprap, and provided other services.

The structures were put to the test this past spring when the snowpack at higher elevations melted quickly because of above-normal temperatures. This, combined with rain, again caused extensive erosion in the watershed, but the debris basins trapped the sediment, and the concrete wall contained the heavy runoff so no flooding occurred in Smelterville.

"RC&D has truly been a blessing to us," said Bill Noyen, resident of Smelterville and former commissioner for Shoshone County. "Without RC&D, our town would have washed down the creek last spring."

The ultimate solution involves revegetating the bare area to control the erosion. Because of the rough terrain, a helicopter was contracted to seed the bare portion of the watershed. SCS provided seed for a mixture of three legumes and seven grasses: alsike and Ladino clovers, birdsfoot trefoil, redtop, red fescue, Canada bluegrass, Altai fescue, perennial ryegrass, Alkar tall wheatgrass, and cereal rye.

In spite of the soil's poor condition, the establishment rate was good, especially where seeds found small depressions or drainage areas where silt has accumulated. Redtop, birdsfoot trefoil, and Canada bluegrass have done the best. In some of the more critical areas, more than 5 seedlings per square foot are now growing, and officials expect a 50 percent stand within 5 years. The greening of Silver Valley has begun.

Gerald T. Johnson,
RC&D coordinator, SCS, Coeur d'Alene, Idaho

We're Off to See the Wizard!

When Lynn Betts, Soil Conservation Service State public affairs specialist in Iowa, needed a magician, he wasn't able to pull one from his hat, but he did the next best thing—he turned to the telephone directory.

Betts developed a way to deliver the agency's conservation message by using a magician to dramatically show the effects of soil conservation practices.

Betts found professional magician/humorist Jim Mullica of Des Moines, Iowa, in the telephone directory and enlisted him for the project. Betts and the SCS State office staff worked closely with Mullica to blend the entertainment qualities of his magic act with the soil conservation message.

In December, the show was taped before a live audience at the Iowa Association of Soil Conservation District Commissioners. The final version, entitled "The Soil Wizard," runs 16 minutes. Copies of the tape have been mailed to every SCS State office.

The Pioneer Seed Corn Company aided in the production of the program, which Betts believes will be widely used in education circles.

Updating Resource Surveys

The information that several thousand soil conservation specialists collect this year for the 1987 National Resources Inventory (NRI) is a strong link in a chain of inventories, past and future.

The first link backward is to the 1982 NRI, the most comprehensive inventory of soil, water, and related resources ever carried out in the United States. A second link is to the 1977 National Resources Inventory, the first of the NRI's.

A major link to the future will be through the appraisals of the Nation's soil, water, and related resources that the Soil Conservation Service (SCS) conducts under the Soil and Water Resources Conservation Act of 1977, as amended by the Food Security Act of 1985.

All of the NRI's are in a line of USDA resource surveys going back to the first one, in 1934. Since 1935, SCS has conducted national resource surveys for USDA at about 10-year intervals, in addition to special studies such as the 1975 potential cropland study.

This year's NRI actually is an update of the comprehensive 1982 NRI. SCS inventory specialists began working on the design months ago, with the Statistical Laboratory at Iowa State University (ISU). ISU has helped SCS develop sampling designs for the past 30 years.

The 1982 NRI called for thousands of skilled SCS personnel to spend many hours in the field collecting a huge amount of data. Much of that information remains current and very valuable to many types of users. But some of it must be updated, as required by the Rural Development Act of 1972, because land condition and use are changing rapidly.

Information being collected for the 1987 NRI is in eight major categories: soil characteristics and interpretations, land cover, land use, erosion, land treatment, conservation treatment needs, vegetative conditions, and potential cropland.

As with all other NRI's and SCS resource surveys, the 1987 NRI covers roughly two-thirds of the Nation's land areas—the estimated 1.5 billion acres of nonfederal rural land. This includes Indian lands and land belonging to State and local governments.

But it excludes Federal lands such as the national parks, the national forests, and other Federal lands such as the national wildlife refuges. It includes the 48 conterminous States, Hawaii, Puerto Rico, and the U.S. Virgin Islands, but not Alaska.

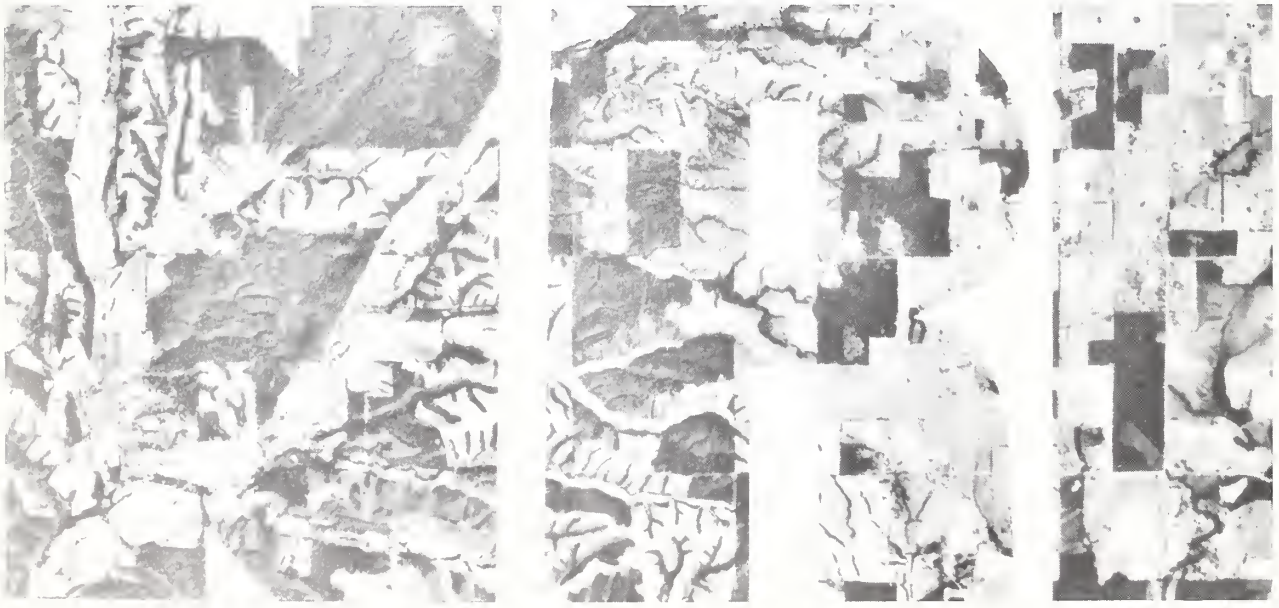
All SCS State offices and some SCS area offices will use microcomputers for the first time to enter, edit, and transmit inventory data. SCS began installing microcomputers under its Field Office Communication and Automation System (FOCAS) in the fall of 1985.

The 1987 NRI data base will comprise data taken from four sources: (1) information already available in the 1982 NRI data base, (2) information items collected for each primary sample unit (PSU), (3) data collected for each specific sample point, and (4) county base data.

The major information-gathering work for the 1987 NRI consists of updating selected 1982 NRI data items. A special procedure was developed to facilitate the updating, which States are scheduled to complete by September 30, 1987.

SCS district conservationists (DC's) and their staffs in the local field offices do much of the work to obtain the needed information out on the land itself.

Several advances in technology are helping to streamline the 1987 NRI and cut down on the valuable hours of field staff time required to obtain the needed data. A



major advance is remote sensing, being used to a far greater degree in 1987 than in 1982.

A study by SCS showed that several remote sensing products are accurate and reliable information sources of some types of data needed for the NRI's. These products include infrared high altitude photography and 35mm aerial slides taken at low altitudes, which increasingly are more readily available to SCS for several purposes, including resource inventories.

The streamlining combined with the decreased number of sample units and points being inventoried means that the amount of legwork is way down for the 1987 NRI. Data will be collected for some 104,000 PSU's, less than a third of the 365,000 PSU's included in the 1982 NRI. The PSU's are square tracts of land, ranging in size from 40 to 640 acres, but typically 160 acres.

For each PSU, data are collected for one, two, or three randomly selected sampling points. That means SCS staff will be gathering information for more than 300,000 sampling points or sites to update the 1982 bank of statistics on the Nation's soil, water, and related resources.

The number of PSU's selected for the 1987 NRI means the inventory will be reliable at the State level. Projections therefore can reasonably and accurately be made about resource conditions by State.

States that want to have information reliable at a county or regional level may easily supplement the number of PSU's to obtain more detailed data. Some States are considering this option for certain river basin and high-priority county studies.

States are planning to transmit all of the sample data gathered within their boundaries to the ISU Statistical Laboratory by November 1, 1987. The laboratory, in turn, will perform the needed analyses and statistical "expansion" of the data and provide preliminary national, regional, and State figures for review by early 1988. SCS and ISU expect to release the final 1987 NRI data by mid-1988.

County base data included in the NRI are compiled in cooperation with the Bureau of the Census and other Federal agencies. These data provide basic information for the surface area of each county, by Major Land Resource Area. Such information includes the extent of large water areas, land owned by the Federal Government, rural land devoted to highways, transportation facilities, and rights-of-way, and certain urban and built-up areas.

SCS field office staffs have completed these worksheets. SCS State offices have reviewed and forwarded them to the ISU Statistical Laboratory.

In early 1984, SCS asked the National Research Council's Board on Agriculture to evaluate potential applications of the 1982 NRI. The board responded by calling a workshop of experts on the statistical design and content of the 1982 NRI and, later in the year, a national convocation on the "Physical Dimensions of the Erosion Problem."

The Board's Committee on Conservation Needs and Opportunities issued a two-volume report in 1986. Some of the Board's recommendations for improving future inventories to make them more useful have been included in the 1987 NRI: collecting information on ephemeral gully erosion, types of conservation tillage being practiced, and the ecological condition of rangelands. "There will always be a need for resource inventories," the Board on Agriculture concluded.

Future inventories may contain better estimates on such critically important items as the off-site effects of soil erosion on water quality, if the Board's recommendations are followed.

Meanwhile, SCS will employ the NRI's of the 1980's to do all that it can to meet the needs of many kinds of users for information on resource conditions and trends. Probably no group is in more immediate need of that information today than working farmers and ranchers, who particularly need to be aware of the needs in their respective counties and States.

Nadine E. Pitts,
former writer-editor and now retired,
Public Information Staff, SCS, Washington, D.C.

The Traveling Conservationist

When Larry Parvin pulls up at a farm in Blair County, Pa., and gets out of the car with a suitcase, he's not coming to stay. He is bringing the latest in conservation technical assistance to the farm.

As district conservationist for the Soil Conservation Service, Parvin is a welcome visitor on most farms in the county. He has helped many farmers develop conservation plans for controlling soil erosion and improving the efficiency of their farming operations. And he travels with a suitcase.

Parvin has equipped a standard two-suiter with a portable computer terminal, a disk drive, a printer, an acoustic coupler, and an assortment of cables and cords. He can operate the computer alone in the field or hook it by telephone to a larger computer in the SCS office. It can be powered by rechargeable batteries, a car cigarette lighter, or a standard electrical outlet.

"This system allows me to take my office files with me to any farm," said Parvin. "The farmer and I can develop a conservation plan and the farmer can have a copy before I leave. I am averaging 4 to 5 hours per planning acre as compared to 7 to 10 hours before."

The system is not standard SCS equipment, but is on loan to the Blair County Conservation District. SCS is working with the U.S. Department of Agriculture (USDA) and USDA's Rural Electrification Administration to procure similar portable computer hardware for agencywide use.

Parvin said the portable computer is valuable in developing contracts with farmers for an accelerated land treatment project in the Clover Creek Watershed and in field reviews of erosion and sediment control plans with land developers.

Parvin said most farmers like the operation and appreciate the service. A few, however, are wary. "I never get my suitcase out," he said, "until I get to know the farmer."

Frederick E. Bubb,
public affairs specialist, SCS, Harrisburg, Pa.

Moving?

Send present mailing label and
new address including zip code to:

U.S. Department of Agriculture
Soil Conservation Service
P.O. Box 2890, Room 6202–S
Washington, D.C. 20013–2890

Official Business
Penalty for private use, $300

THIRD-CLASS BULK RATE
POSTAGE AND FEES PAID
USDA-SCS
WASHINGTON DC
PERMIT NO. G-267

News Briefs

What is Soil Erosion?

A raindrop hits the soil. And if that soil is unprotected, it may wash away. Eroded soil decreases farmland productivity, fills ditches, pollutes streams, and by displacing water in streams and rivers, even causes flooding.

"What is Soil Erosion?" is a slide show produced recently by the Soil Conservation Service to explain the process of soil erosion and the onsite and off-site damage it can cause. The show focuses on farmland, where most soil erosion occurs, and discusses ways to best control the problem.

The 93-frame presentation can be ordered in slide set for $24.50, filmstrip for $14, VHS or Beta videotape for $10, or 3/4-inch U–Matic for $18. Copies can be ordered from the Photography Division, Office of Governmental and Public Affairs, USDA, Washington, DC 20250.

Erosion Control Symposium Scheduled

The American Society of Agricultural Engineers (ASAE) is holding a conference, "Optimum Erosion Control at Least Cost," on December 14–15, 1987, at the Hyatt Regency Chicago in Illinois Center, Chicago, Ill. Among the cooperating organizations are six U.S. Department of Agriculture agencies. One of these is the Soil Conservation Service.

The conference will cover comprehensive, cost-efficient development of complete conservation packages designed to meet specific needs. State-of-the-art information on planning and applying conservation systems will be presented.

Topics covered will include costs associated with soil erosion control and the impact of control structures, cropping systems, and tillage.

Peter C. Myers, Deputy Secretary of Agriculture, is scheduled to make the featured presentation at the conference.

The 1½-day meeting will include: a keynote presentation, the presentation and discussion of technical papers, poster sessions, and an open discussion among participants.

Call For Papers

Restoring the Earth, a nonprofit organization, in cooperation with the University of California, Berkeley, is sponsoring a national conference on natural resource restoration and environmental planning at the University of California, Berkeley, on January 13–16, 1988.

Topics to be covered include restoration of coastal ecosystems and estuaries; rivers and lakes; streams and fisheries; rangelands, prairies, mined lands, forests, and wildlife; atmosphere and climate; dry lands and agricultural lands, redesign of human settlements; and control of toxic wastes. The nontechnical sessions will include discussions of relevant policy issues, legislation, litigation, conflict resolution, trends, and accounts of restoration successes. Proceedings will be published.

Abstracts of proposed papers are due by October 15, 1987. Final text of accepted papers will be due November 30, 1987. Send proposals to Restoring the Earth Conference, 1713 Martin Luther King, Jr. Way, Berkeley, CA 94709. Write or telephone (415) 777–9515 for a list of sessions and preliminary agenda.

New Publications

Conservation Education Computer Software Available

The Soil Conservation Society of America (SCSA) is distributing *Farm and Food Bytes: Soil and Water Conservation*, a microcomputer software package designed for use by students in the 4th grade and above.

The package includes a two-sided diskette, a 38-page student study manual, and a 30-page teacher's guide that includes more than 50 activities and 60 teaching strategies that help blend soil and water conservation into the total curriculum.

The program runs on Apple computers, and will soon be available for IBM-compatibles.

The software may be purchased from SCSA for $29 plus shipping and handling. Contact SCSA, 7515 N.E. Ankeny Road, Ankeny, Iowa 50021–9764.

"Riders on the Storm" Videotape

This 1-hour videotape on nonpoint-source pollution covers movement of urban and rural soil particles and potential contaminants, threats to surface and ground water, and State and national programs on the subject.

Videotapes are available in either VHS or Beta at a $10 charge for rental and shipping.

For more information contact the Soil Conservation Society of America, 7515 N.E. Ankeny Road, Ankeny, Iowa 50021-9764; telephone (515) 289-2331.

U.S. GOVERNMENT PRINTING OFFICE: 1987—180–921/60006